

GENESIS ITU

CompTIA Network+ Fundamentals

Connectivity, protocols, infrastructure & troubleshooting

College-style student textbook & workbook · Clean · Practical · Professional

Zarco AI Systems LLC · Genesis ITU

How to use this book

Read each chapter in order. Learn formal definitions the way employers and exams use them. Complete pause-and-review prompts. Use only authorized lab systems. This course teaches lawful, professional practice.

Table of Contents

- Chapter 1 — Models & language of networking
- Chapter 2 — Media & wireless
- Chapter 3 — IPv4, IPv6, subnetting
- Chapter 4 — Switching & VLANs
- Chapter 5 — Routing basics
- Chapter 6 — DNS, DHCP, NAT
- Chapter 7 — Network security awareness
- Chapter 8 — Troubleshooting

Chapter 1 — Models & language of networking

Network+ teaches how data moves and how to isolate failures using layered models.

OSI model

Seven-layer model: Physical through Application.

TCP/IP

Practical internet suite of layers and protocols.

Pause and review. Name layers 1–4 and one example at each.

Chapter 2 — Media & wireless

Copper, fiber, and Wi-Fi each have limits and failure modes. Label closets and test cables.

- Document patch panels
- Mind Wi-Fi interference
- Prefer tested known-good cables when swapping

Chapter 3 — IPv4, IPv6, subnetting

Addressing and CIDR are core skills. Know private ranges and why gateways matter.

CIDR

Prefix notation such as /24 describing network size.

Pause and review. Explain 192.168.1.0/24 in plain language.

Chapter 4 — Switching & VLANs

Switches use MAC addresses. VLANs segment traffic for design and security.

MAC address

Interface hardware address on a local segment.

Chapter 5 — Routing basics

Routers connect networks using tables; default routes handle unknown destinations.

Pause and review. *How does a default gateway help a PC reach the internet?*

Chapter 6 — DNS, DHCP, NAT

DNS names, DHCP assigns, NAT translates at boundaries. Many outages are DNS/DHCP.

DNS

Hierarchical name resolution system.

NAT

Maps private addressing to public at a network edge.

Chapter 7 — Network security awareness

Segmentation, secure management, modern Wi-Fi security, and least privilege.

- Change default passwords
- Encrypt management access where possible

Chapter 8 — Troubleshooting

Physical → IP → gateway → DNS → application. Use ping, traceroute, nslookup as authorized.

Pause and review. Five-step check for a user who cannot open a website.

Closing

Review every formal definition before practice exams. Continue with labs, instructor video when available, and job-path practice on NodePath or REACH. Genesis ITU wishes you steady progress.

Genesis ITU · Educational use · Authorized systems only